//Euler's Modified Method

```
function g=f(x,y);
   g=2-2*y-exp(-4*x);
endfunction
x0=0;
y0=1;
h=0.1;
xn=0.5
x=x0:h:xn;
y=zeros(size(x))
for j=1:5;
   y(j+1)=y(j)+0.5*h*f(x(j),y(j))+0.5*h*f(x(j+1),y(j));
   disp(y(j+1));
end
```

    0.116484

    0.2372047

    0.3522376

    0.4566356

    0.5484469

//RangeKutta Method (RK2)

```
funcprot(0)
function g=f(x,y)
   g=2-2*y-exp(-4*x);
endfunction
x0=0;
y0=1;
h=0.1;
xn=0.5;
n=xn-x0/h;
n=5;
for i=1:n;
   k1=h*f(x0,y0)
   k2=h*f(x0+h/2,y0+(k1/2))
   y1=y0+k2
   x0=x0+h;
   y0=y1;
   disp([x0,y1])
end
```

0.1   0.9281269

0.2   0.8928861

0.3   0.8798720

0.4   0.8798473

0.5   0.8869638

//RangeKutta Method (RK4)

```
funcprot(0)
function g=f(x,y)
   g=2-2*y-exp(-4*x);
endfunction
x0=0;
y0=1;
h=0.1;
xn=0.5;
n=xn-x0/h;
n=5;
for i=1:n;
   k1=h*f(x0,y0)
   k2=h*f(x0+h/2,y0+(k1/2))
   k3=h*f(x0+h/2,y0+(k2/2))
   k4=h*f(x0+h,y0+k3)
   y1=y0+(1/6)*(k1+2*k2+2*k3+k4);
   x0=x0+h;
   y0=y1
   disp([x0 y1])
end
```

0.1   0.9257979

0.2   0.8895091
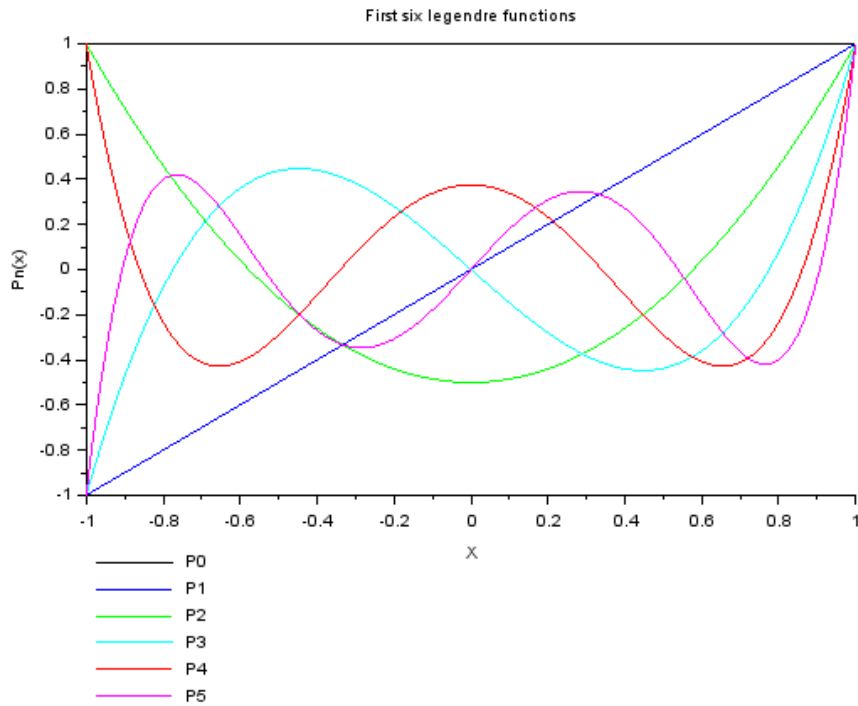
0.3   0.8761963

0.4   0.8762885

0.5   0.8837322

//Legendre Functiuon

n=0:5;

```
x=[-1:0.001:1]'
y=legendre(n,0,x)'
plot2d(x,y,leg='P0@P1@P2@P3@P4@P5')
xtitle(['First six legendre functions'],['X'],['Pn(x)'])
```


First six legendre functions

//Bessel's Function

```
x=[0:0.01:20]';
n=0:5;
y=besselj(n,x)
plot2d(x,y,leg='J0@J1@J2@J3@J4@J5')
xtitle(['First six Bessels function'],['X'],['Jn(x)'],boxed=%t)
```

First six Bessels function